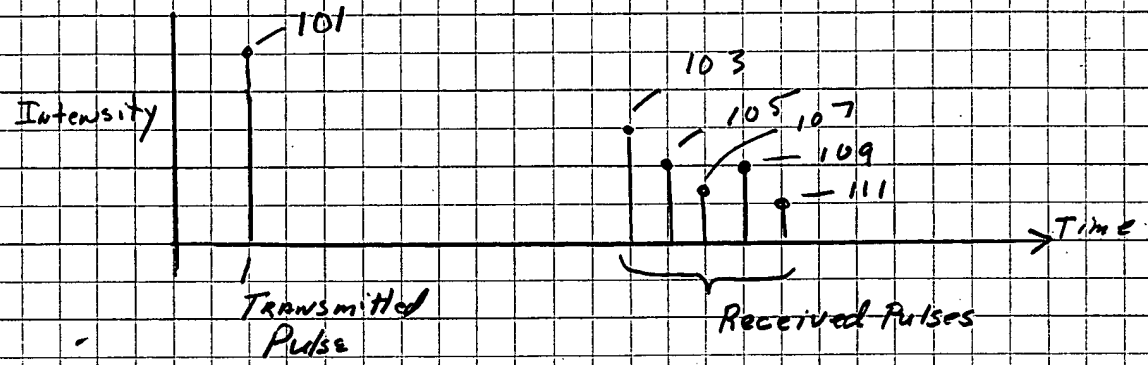


Figure 1A

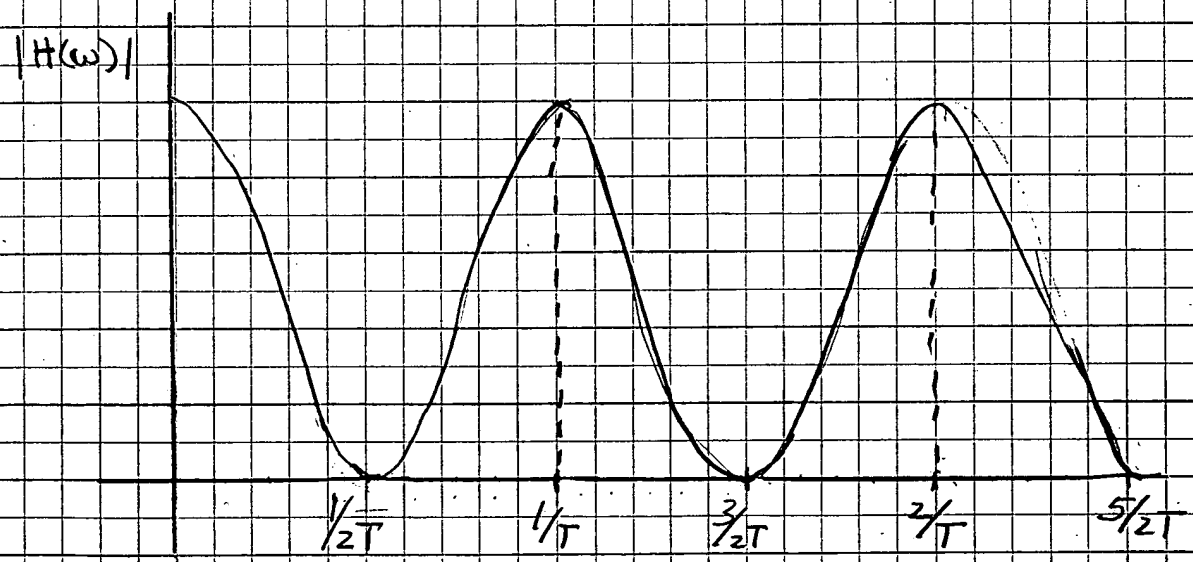
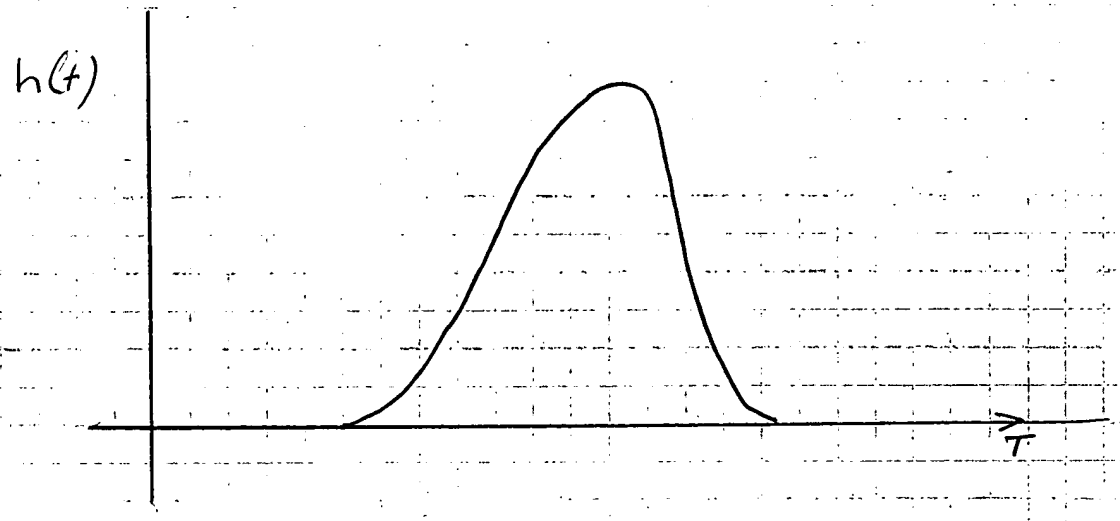


Figure 1B

B600-36980 USA



Figuee 1C.

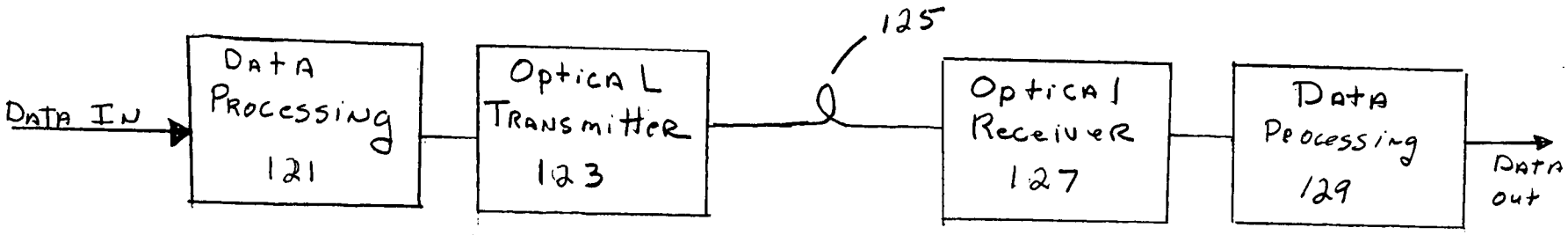

DATA IN
DATA PROCESSING 121
OPTICAL TRANSMITTER 123
125
OPTICAL RECEIVER 127
DATA PROCESSING 129
DATA OUT

Figure #1D

Multicarrier Modulation Block Diagram (Transmitter)

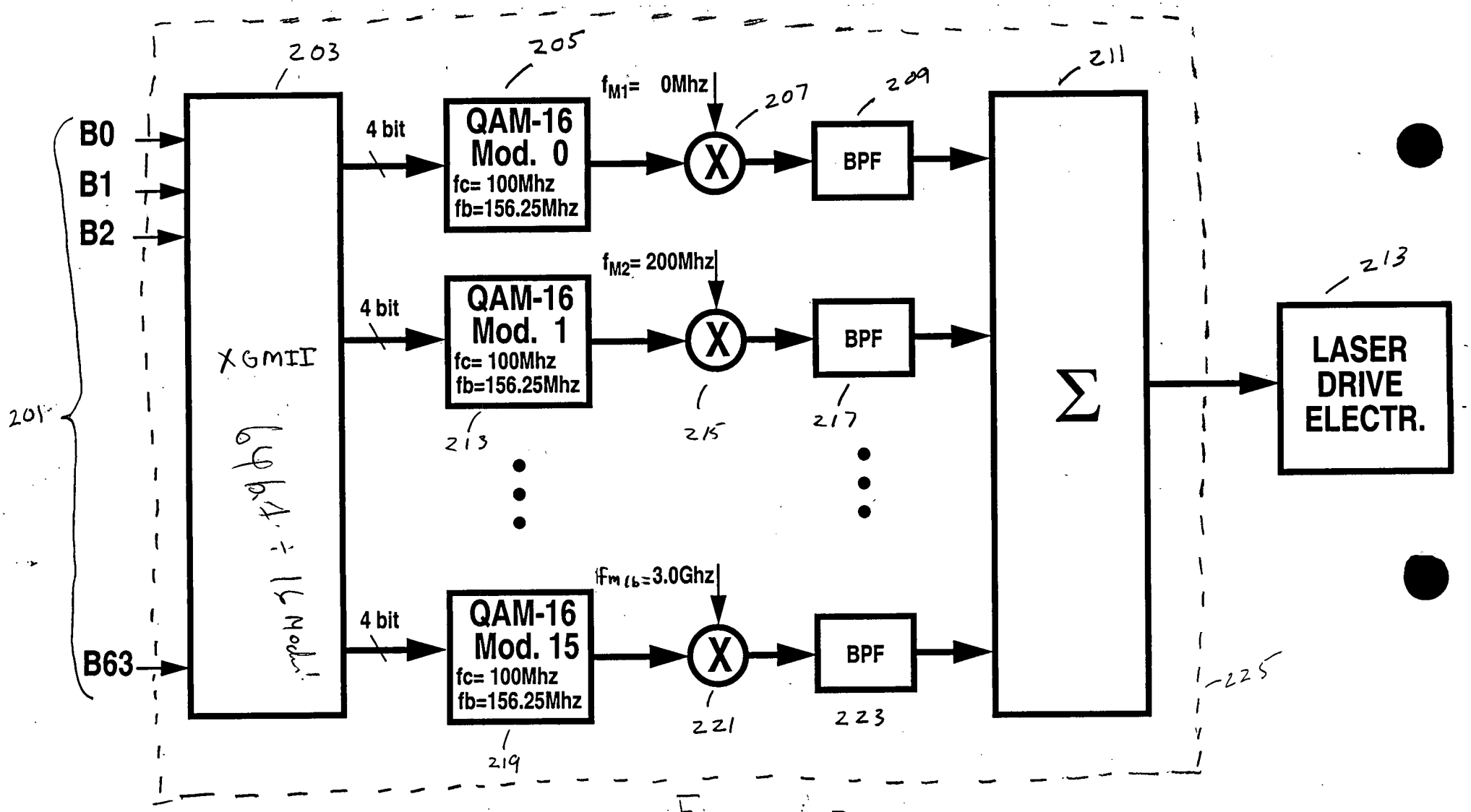
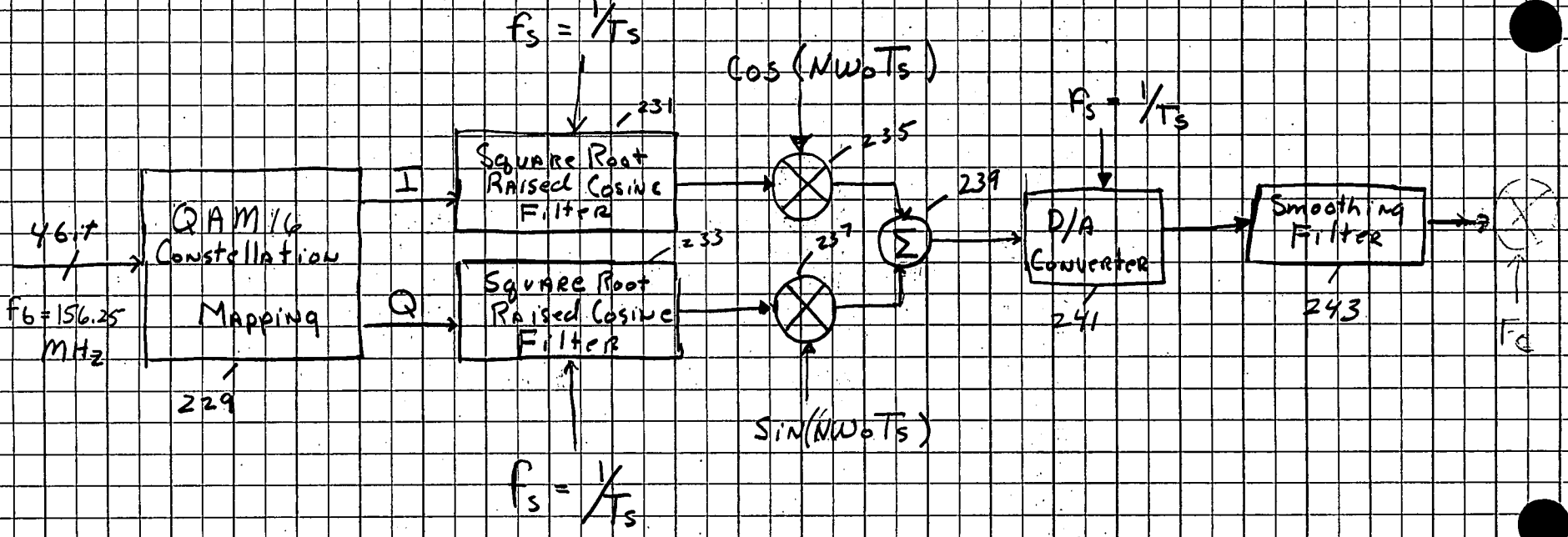


Figure 2

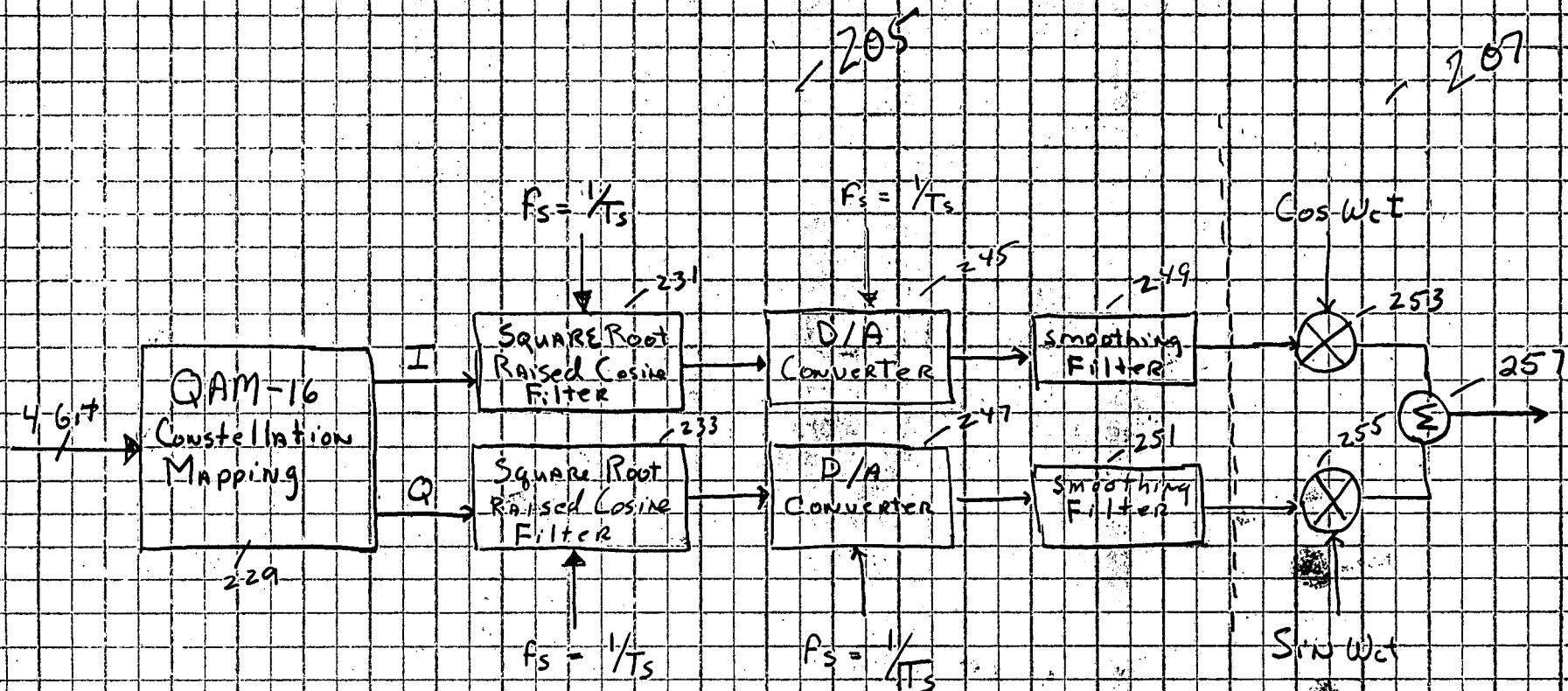
205



T_s = Sampling period - digital

$\omega_N = 2\pi f_s$ = digital carrier angular frequencies.

Figure 2B



T_s = Sampling Period for DSP blocks

$\omega_c = 2\pi f_c$ = Analog carrier angular frequency

Figure 2C

Multicarrier Modulation Block Diagram (Receiver)

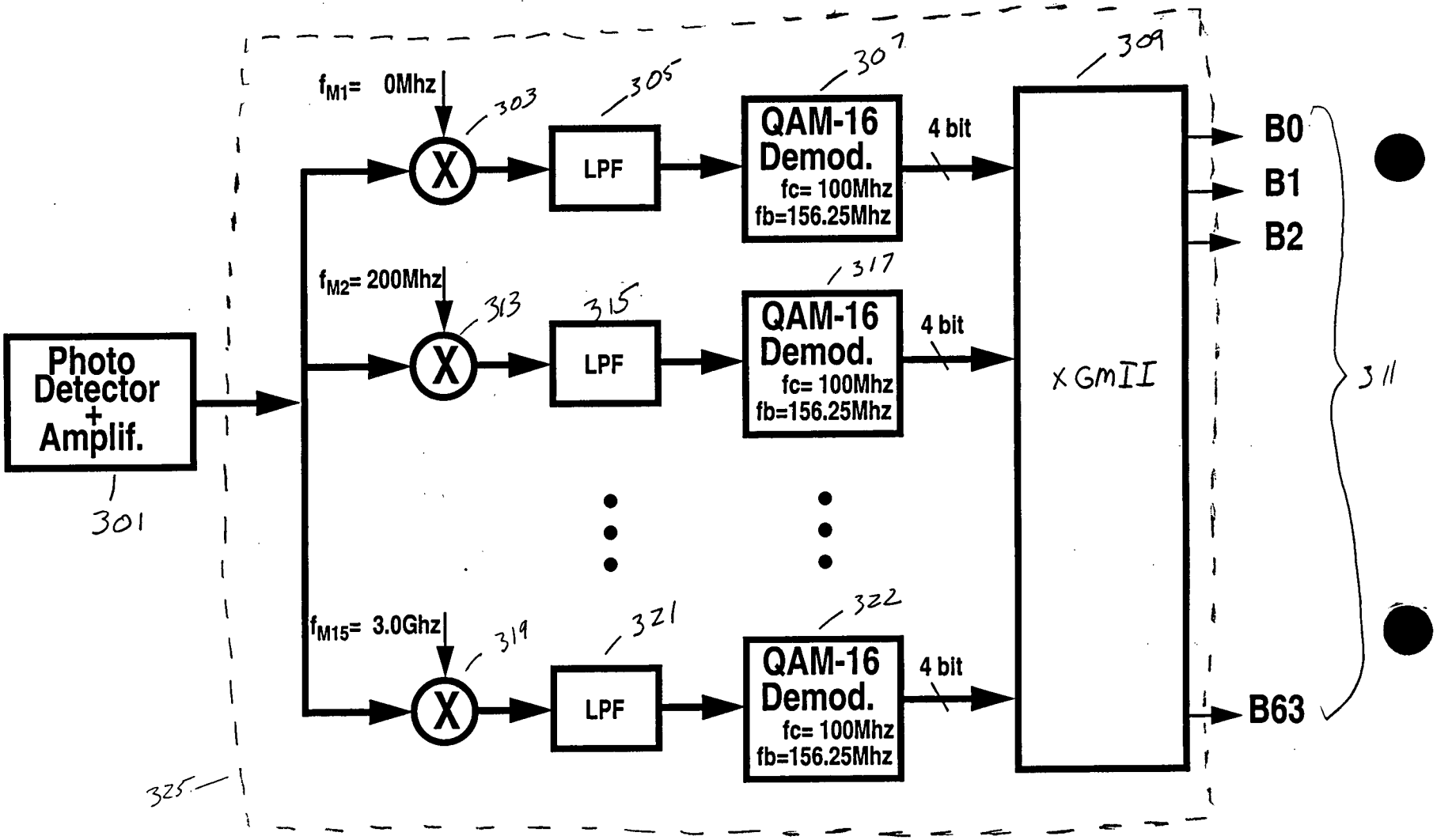


Figure 3

Alternative Implementation of Multicarrier Modulation (Transmitter)

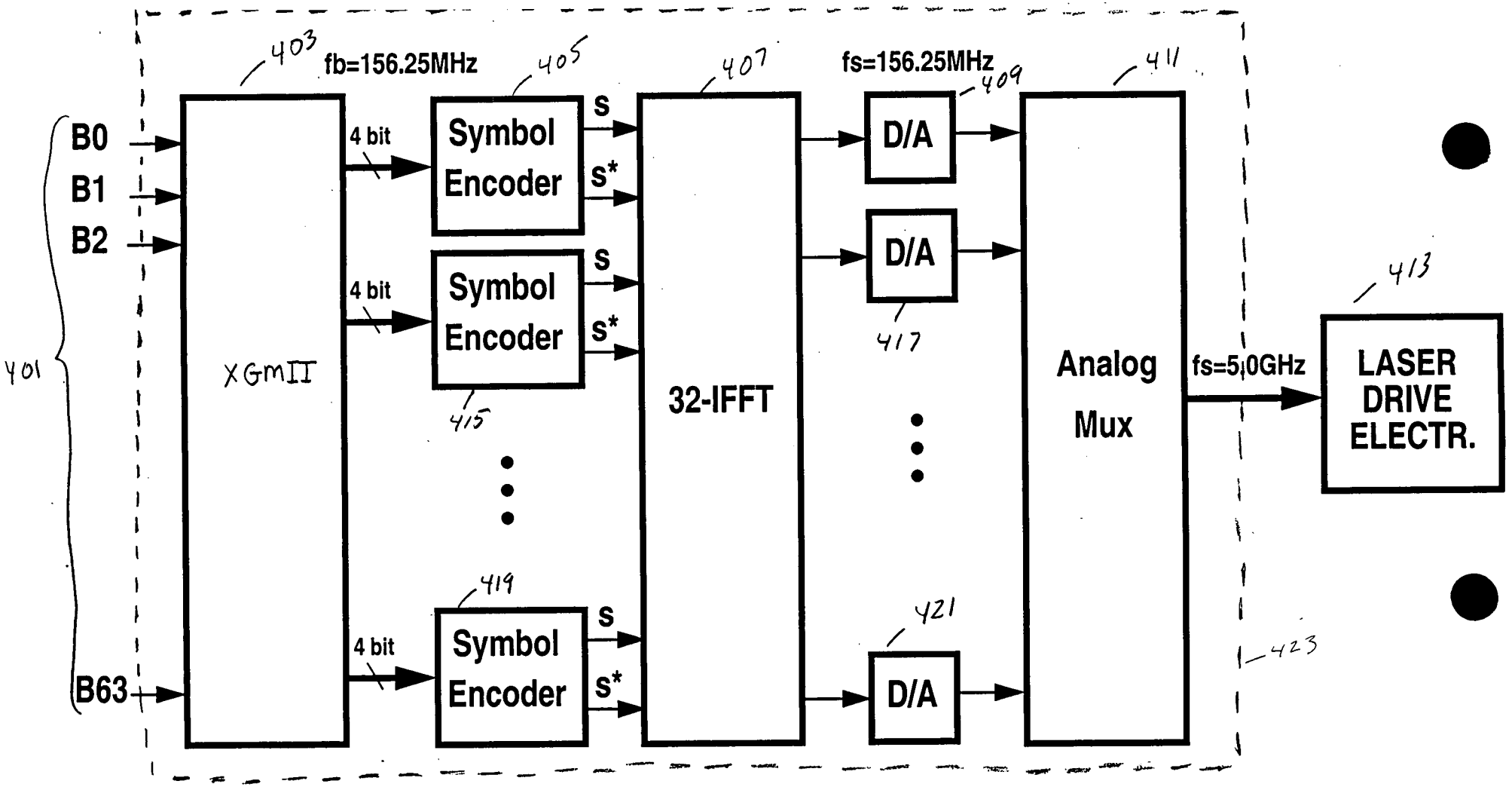


Figure 4

Alternative Implementation of Multicarrier Modulation (Receiver)

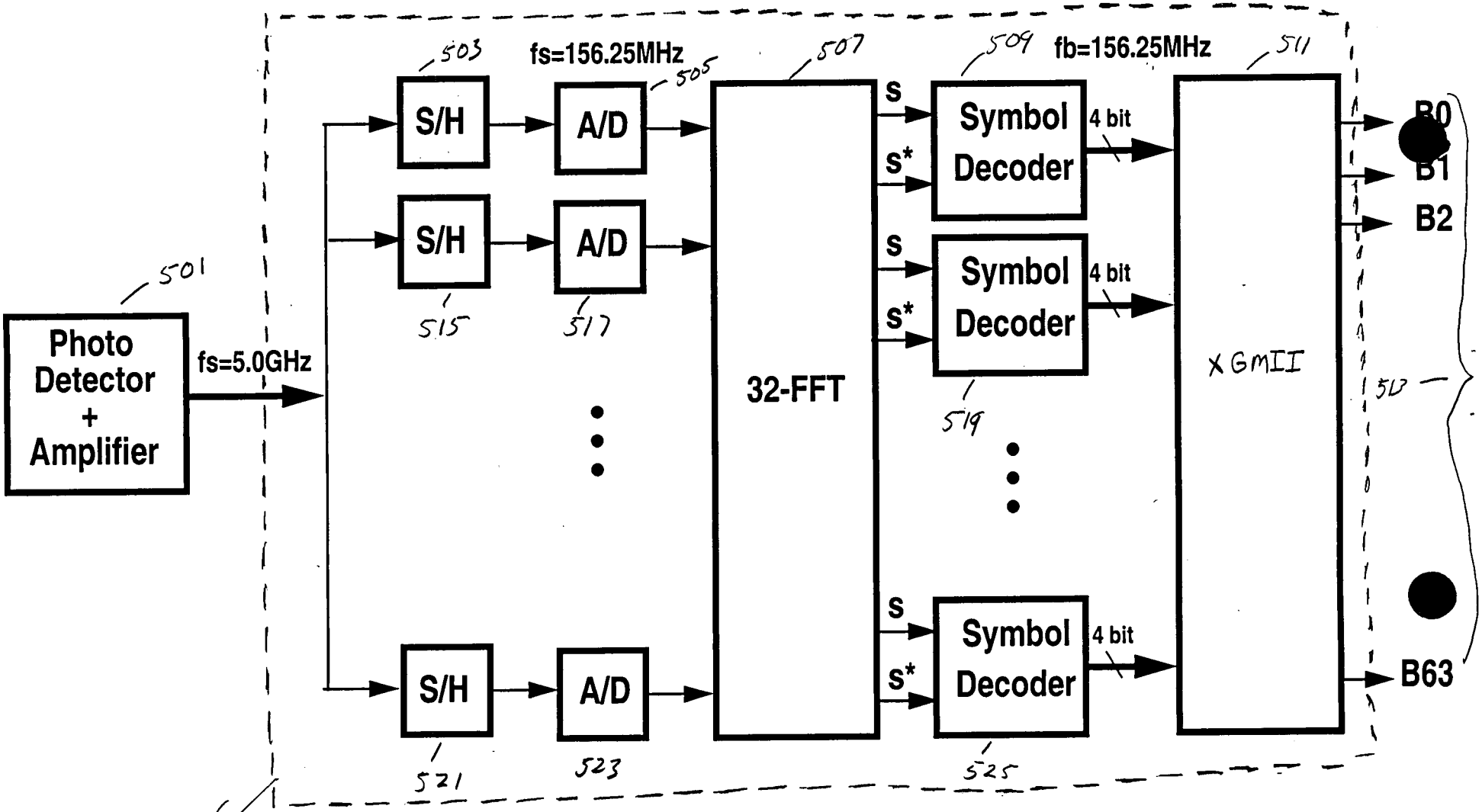


Figure 5

0802OT 6026960

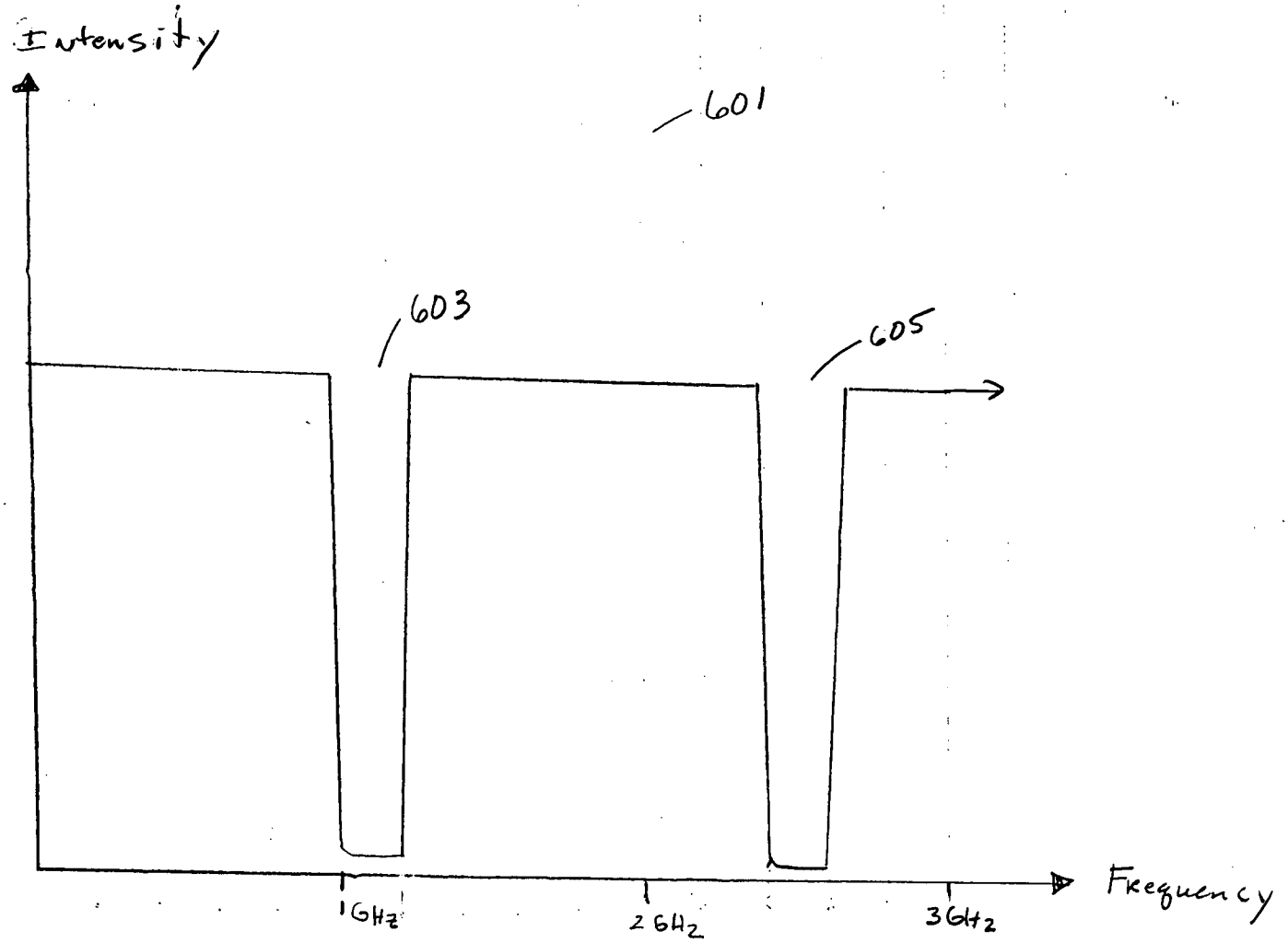


Figure 6

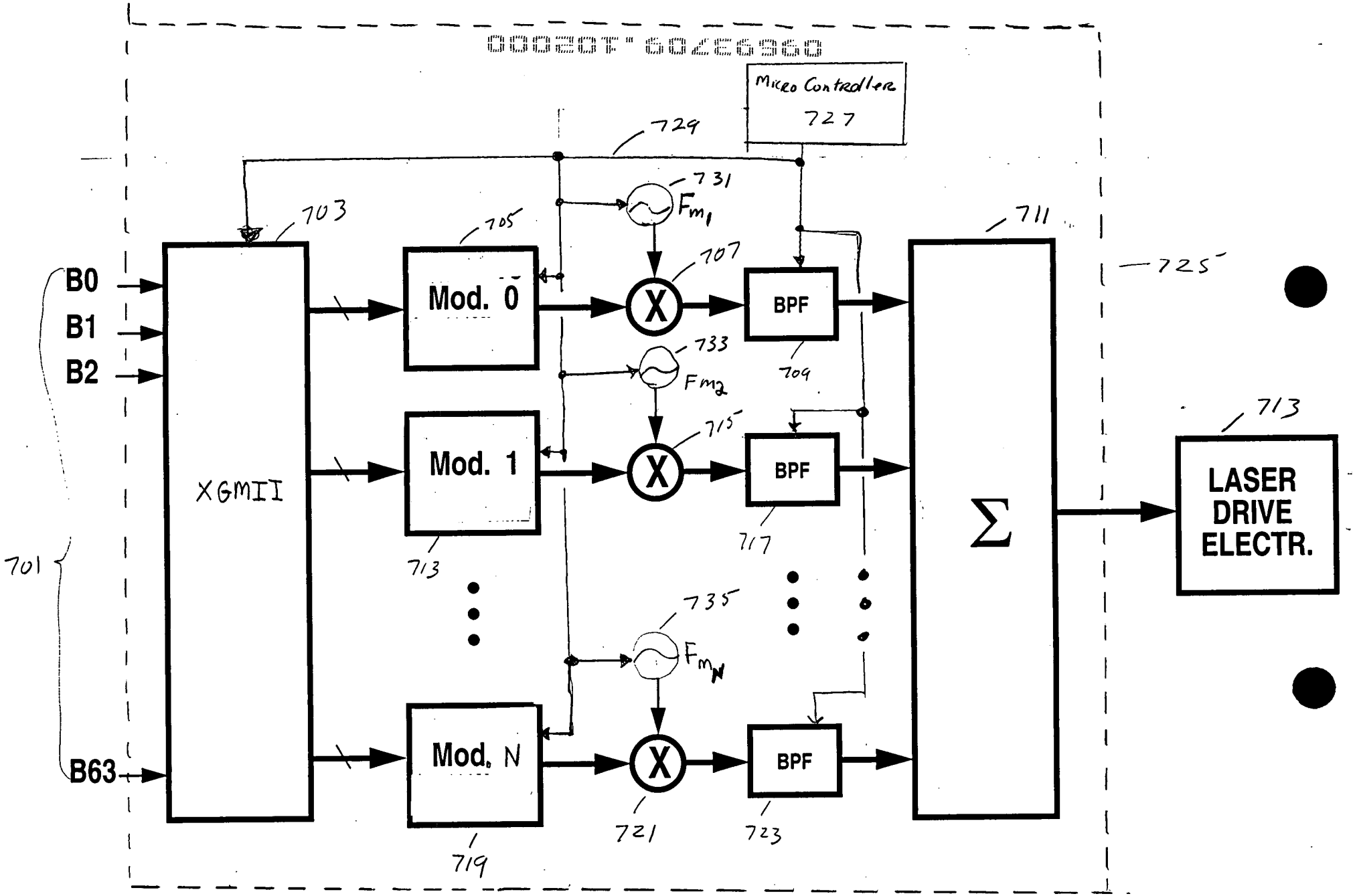

Micro Controller
727
729
731
Fm_1
703
705
711
725
707
B0
B1
B2
Mod. 0
X
BPF
733
Fm_2
709
715
713
XGMII
Mod. 1
X
BPF
717
Σ
LASER DRIVE ELECTR.
701
735
Fm_N
B63
Mod. N
X
BPF
721
723
719

Figure 7A

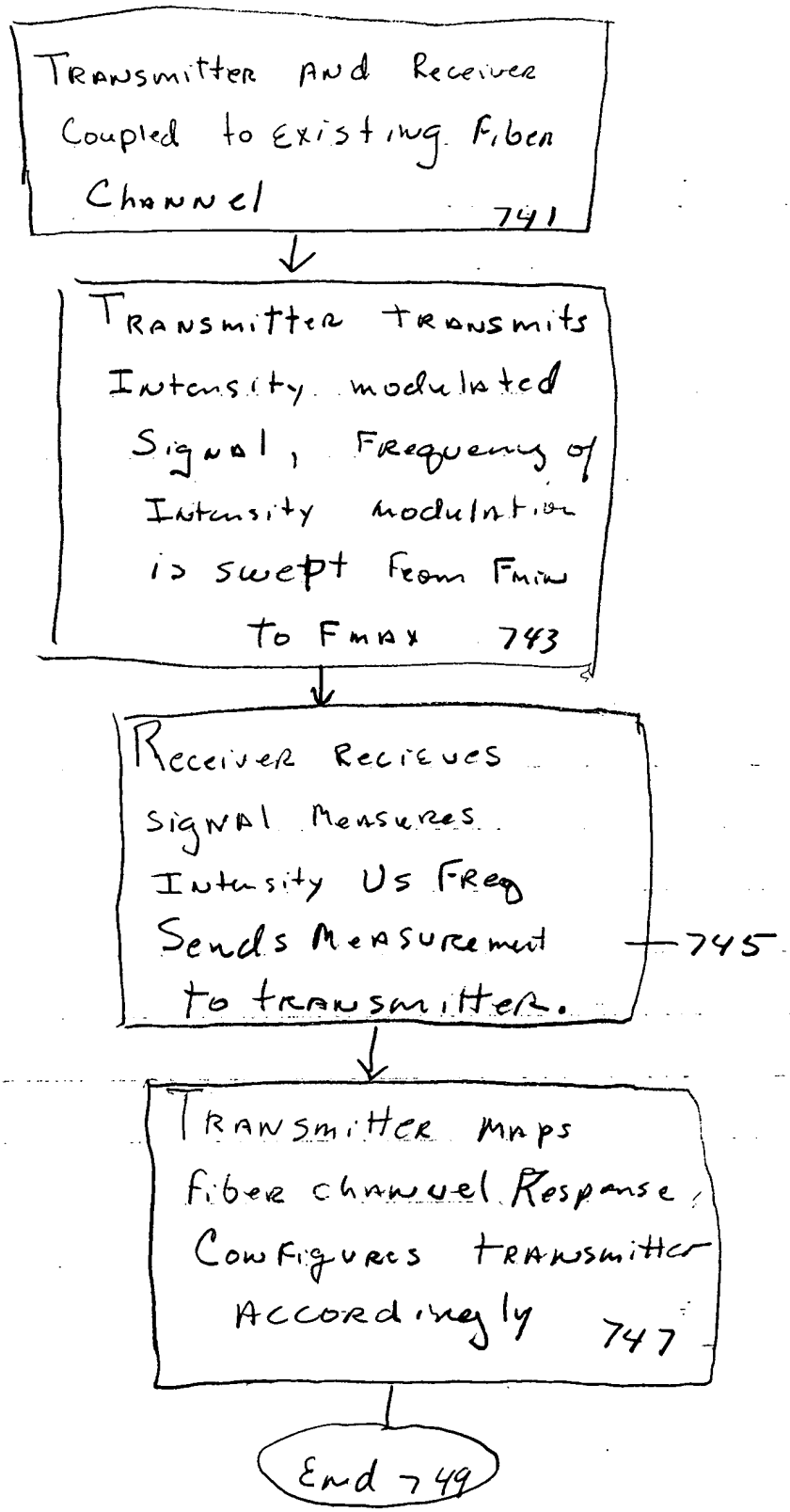

Transmitter and Receiver Coupled to existing Fiber Channel 741
Transmitter transmits Intensity modulated Signal, Frequency of Intensity modulation is swept from Fmin to Fmax 743
Receiver Recieves signal Measures Intensity Vs Freq Sends Measurement to transmitter. 745
Transmitter maps fiber channel Response, Configures transmitter Accordingly 747
End 749

Figure 7B

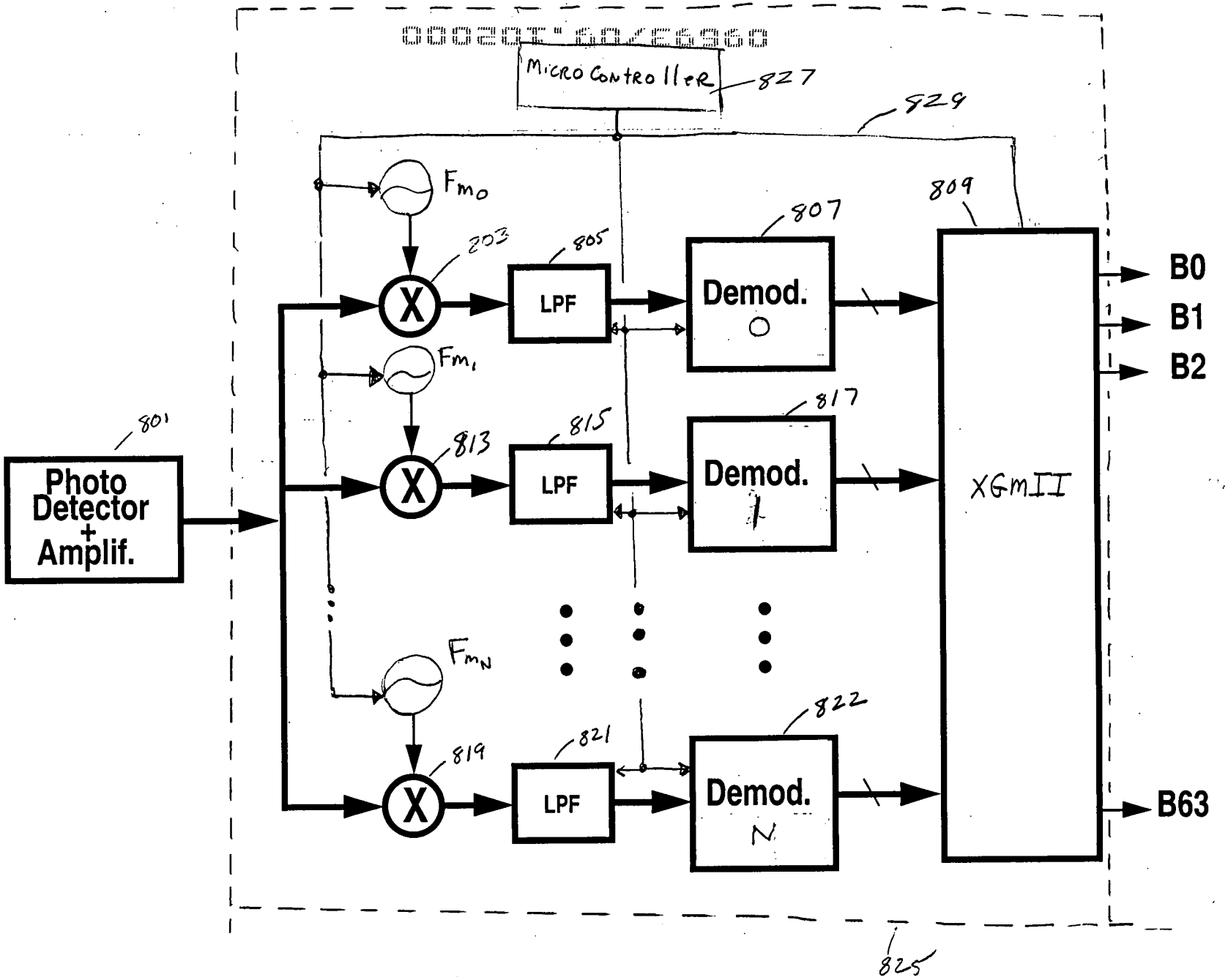

MICRO CONTROLLER
827
829
Fm_0
203
805
LPF
807
Demod.
0
809
B0
B1
B2
801
Photo Detector + Amplif.
Fm_1
813
815
LPF
817
Demod.
1
XGMII
Fm_N
819
821
LPF
822
Demod.
N
B63
825

Figure 8

0002OT-0026960

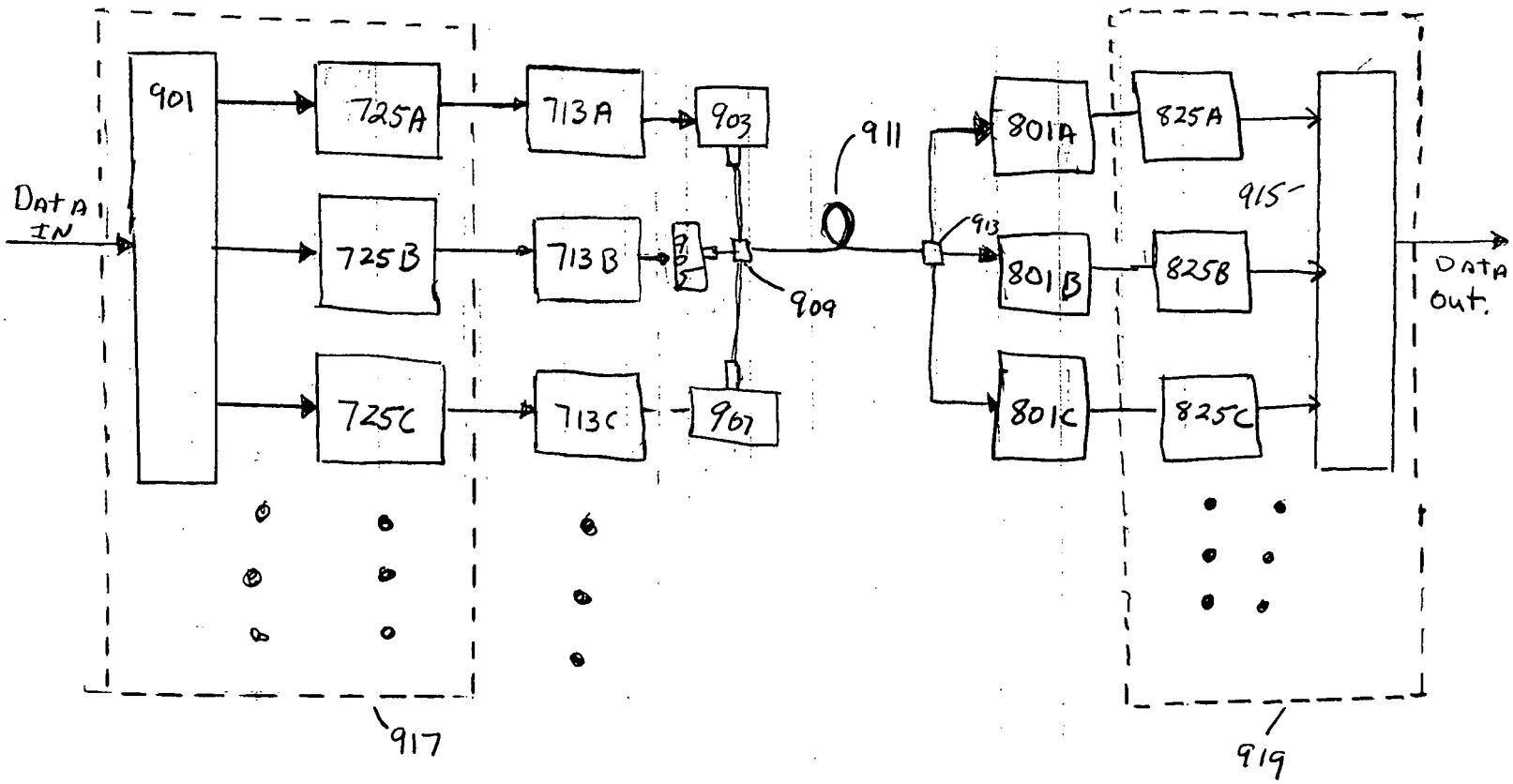


Figure 9

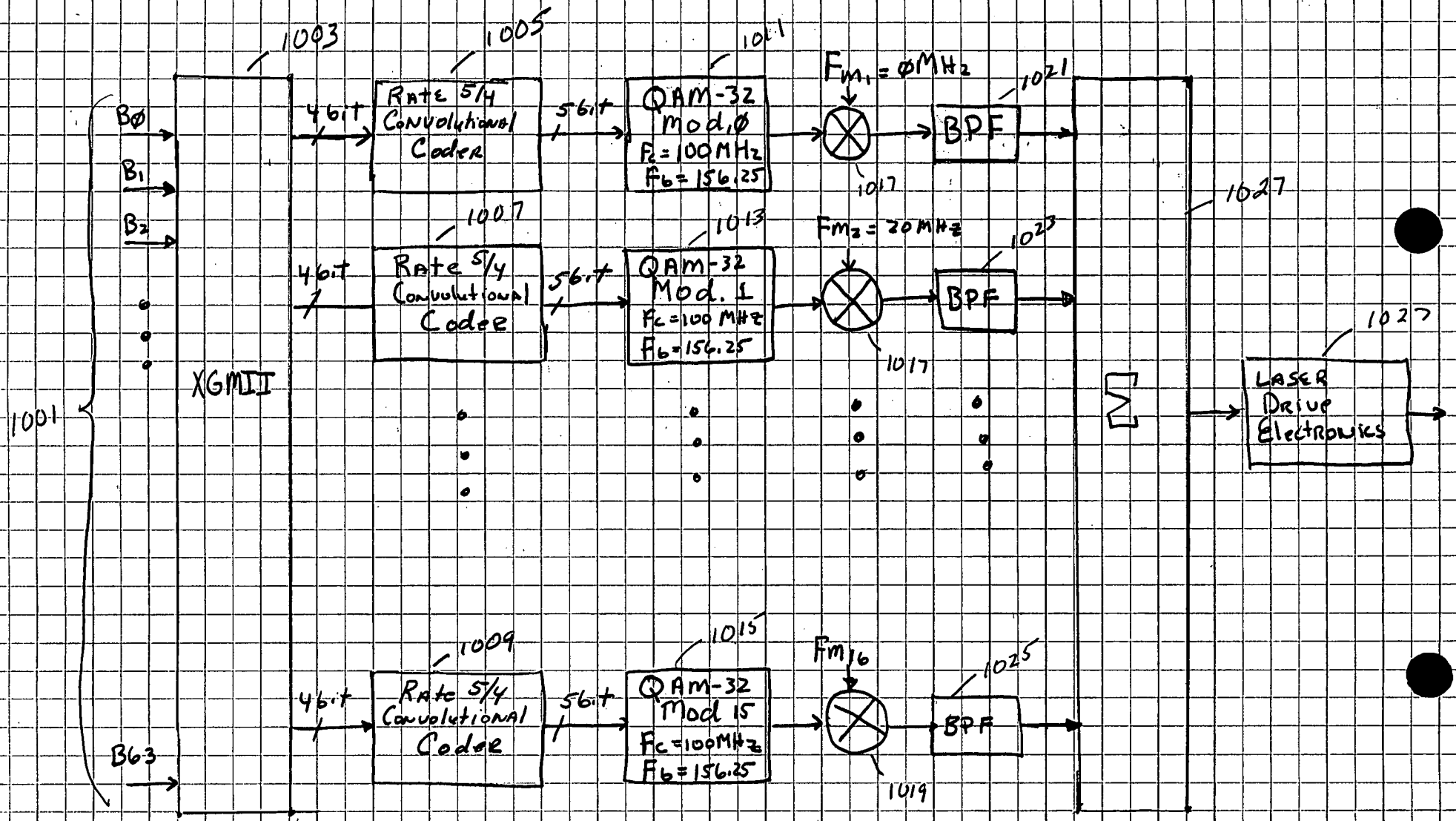

1003
1005
1011
$F_{M_1} = \emptyset MH_2$
1021
B∅
B1
B2
B63
1001
XGMII
46bit
Rate 5/4 Convolutional Coder
56bit
QAM-32 Mod.∅ $F_c = 100MH_2$ $F_b = 156.25$
BPF
1017
1007
1013
$F_{M_2} = 20MHz$
1023
Rate 5/4 Convolutional Coder
QAM-32 Mod. 1 $F_c = 100MHz$ $F_b = 156.25$
1027
LASER Drive Electronics
1009
1015
$F_{M_{16}}$
1025
Rate 5/4 Convolutional Coder
QAM-32 Mod 15 $F_c = 100MHz$ $F_b = 156.25$
1019

Figure 10

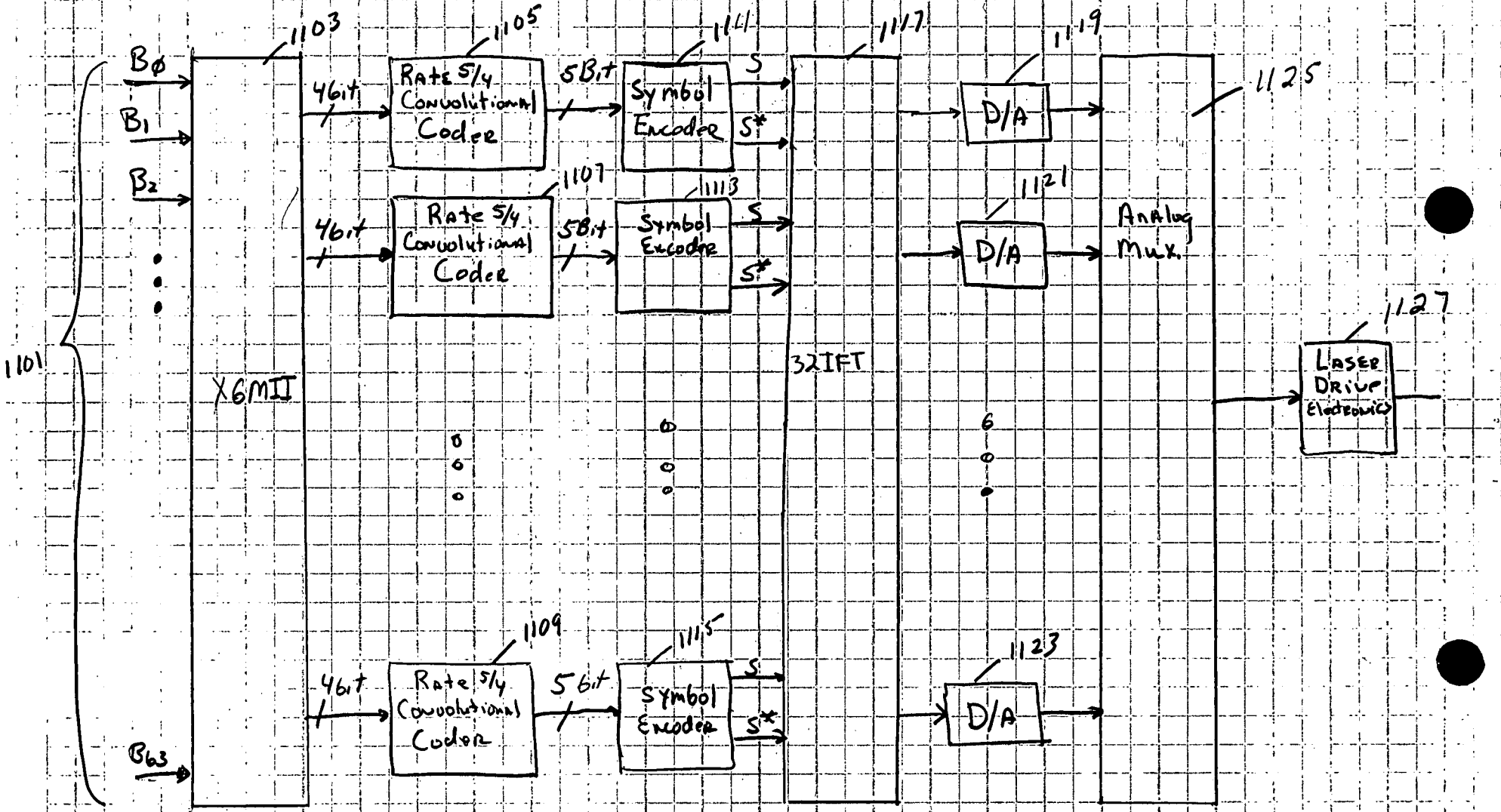

1101
B0
B1
B2
B63
1103
XGMII
1105
Rate 5/4 Convolutional Coder
46bit
5Bit
1111
Symbol Encoder
S
S*
1107
Rate 5/4 Convolutional Coder
46bit
5Bit
1113
Symbol Encoder
S
S*
1109
Rate 5/4 Convolutional Coder
46bit
5Bit
1115
Symbol Encoder
S
S*
1117
32IFT
0
0
0
6
0
0
1119
D/A
1121
D/A
1123
D/A
1125
Analog Mux.
1127
Laser Drive Electronics

Figure 11

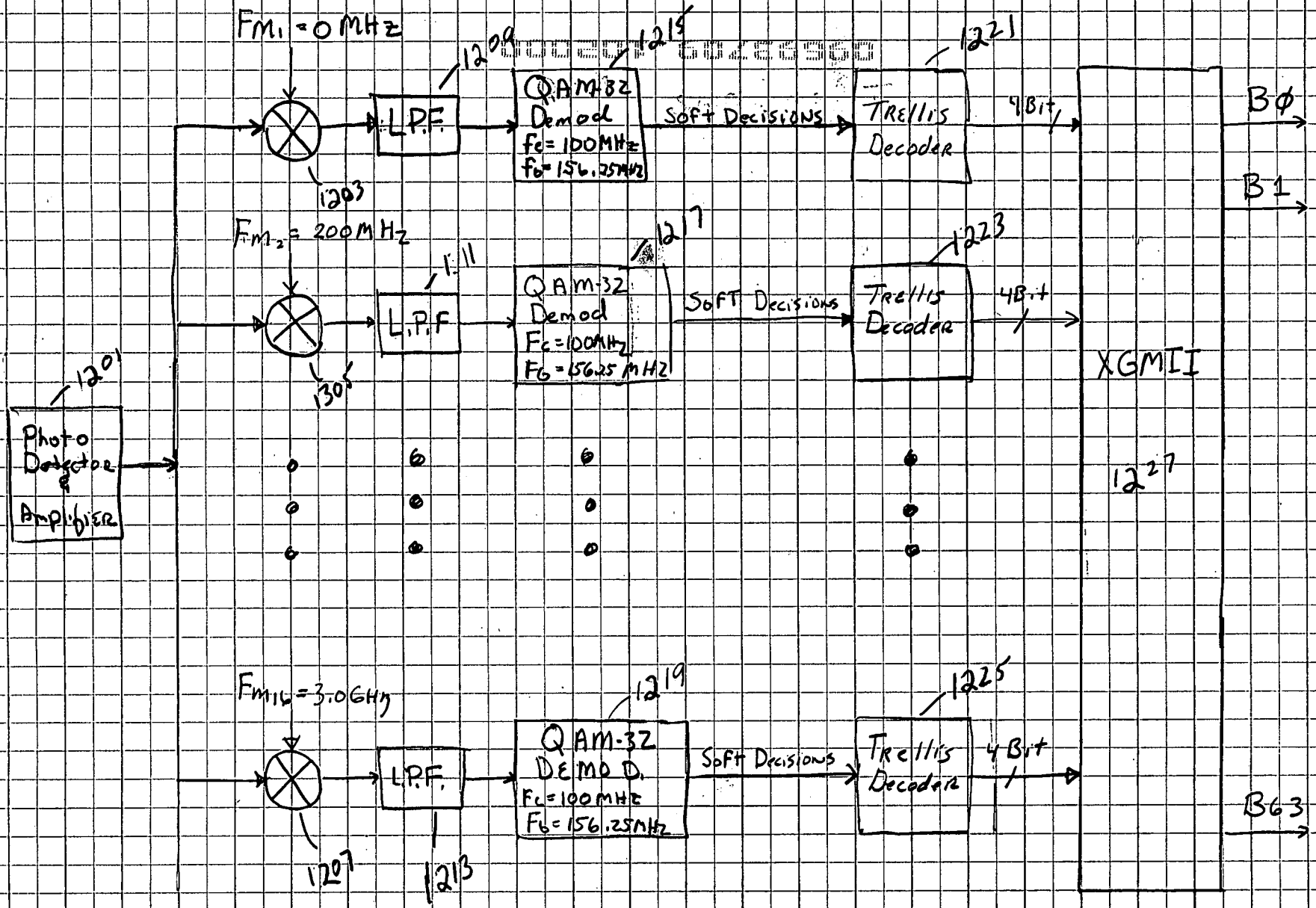

Fm1 = 0 MHz
1205
1215
QAM-32 Demod
Fc = 100MHz
Fb = 156.25MHz
Soft Decisions
1221
Trellis Decoder
4 Bit
B0
B1
Fm2 = 200MHz
1211
L.P.F.
1217
QAM-32 Demod
Fc = 100MHz
Fb = 156.25 MHz
1223
Trellis Decoder
4 Bit
1209
1201
Photo Detector & Amplifier
XGMII
1227
FM16 = 3.0GHz
1207
L.P.F.
1213
1219
QAM-32 DEMOD.
Fc = 100MHz
Fb = 156.25MHz
1225
Trellis Decoder
4 Bit
B63

Figure 12c

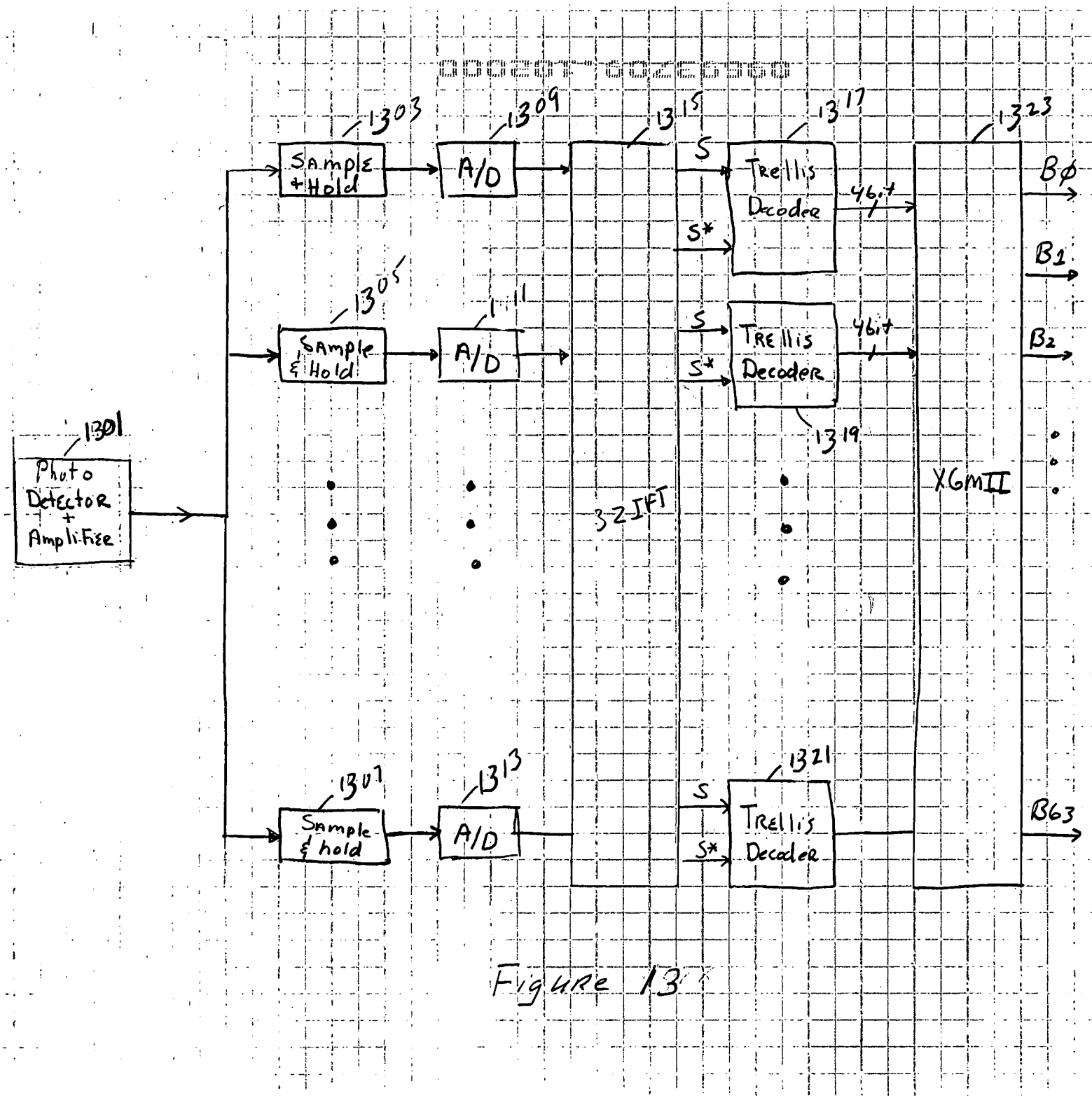

1301
Photo Detector + Amplifier
1303
Sample & Hold
1305
Sample & Hold
1307
Sample & hold
1309
A/D
1311
A/D
1313
A/D
1315
32 IFT
1317
Trellis Decoder
1319
Trellis Decoder
1321
Trellis Decoder
1323
XGMII
S
S*
S
S*
S
S*
46bit
46bit
Bφ
B1
B2
B63

Figure 13